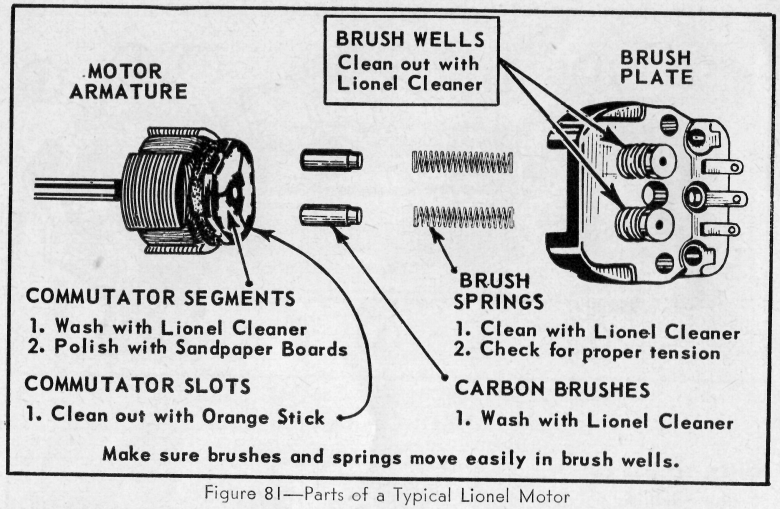


Figure 81—Parts of a Typical Lionel Motor

## HOW TO CLEAN MOTORS

Sluggish and uneven operation of the locomotive is most often caused by a dirty motor. A typical Lionel motor consists of parts illustrated in Figure 81. Although these parts may vary somewhat in shape and arrangement they can be easily recognized and are cleaned in the same way. The most important part to cleaned is the *commutator*, the segmented copper surface on which the carbon *brushes* make their contact. The commutator can be easily seen and reached for cleaning on locomotives having a transversely-mounted motor. To polish the commutator face turn the locomotive on its side and connect one wire from transformer to the locomotive contact roller and the other wire to any metal part of the locomotive body. The motor will then run. While it is running press a small piece of very fine sandpaper against the moving commutator. Then clean out the commutator slots with an orange stick, toothpick, or similar pointed wood instrument.

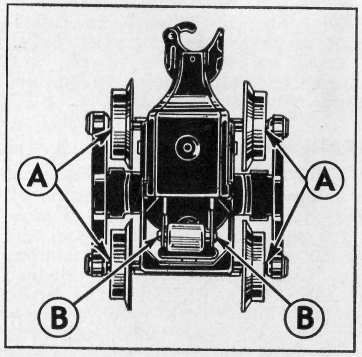


Figure 82—Underside of Car Truck. Lubricate Axle Bearings (A) and Roller Bearings (B)

In locomotives where the motor is mounted lengthwise, the motor can be reached only after the locomotive body is removed. In many of them the commutator can be reached through a hole in the brush plate.

## LUBRICATING CAR TRUCKS

Improperly lubricated car trucks may double the drag on your locomotive. Spin the wheels by hand. If they show any signs of drag or binding remove the old lubricant and the accumulated dust and dirt with Lionel Cleaner and apply a dab of fresh lubricant at points A. If the truck is equipped with a contact roller, apply lubricant at the roller axles as well (Points B). Unless this is done the axles will eventually grind through the contact brackets.



## REPLACING HEADLIGHT LAMPS

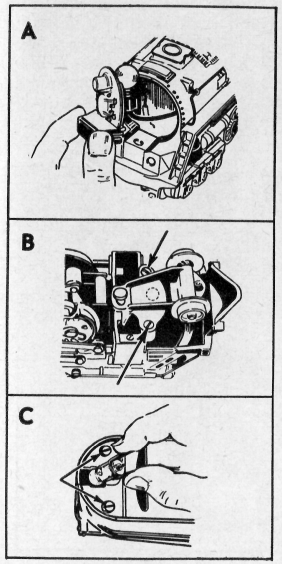


Fig. 83—Replacing Lamps

If the bulb in the locomotive headlights or in an illuminated accessory does not light, first check to see that the bulb is tight in its socket. If the lamp is burned out you can easily replace it yourself by obtaining a spare from your dealer. The chart on the inside of the back cover lists replacement lamps for all modern Lionel equipment.

To reach the head lamps of 1950 Lionel locomotives follow the directions below:

| | |
|---|---|
| 622 | Remove cab by inserting a screwdriver in the slots on the bottom and turning them as indicated. |
| 681 | Pull out boiler front (Fig. 83A). |
| 736 | Open hinged boiler front. |
| 773 | Open hinged boiler front. |
| 2023 | Remove locomotive body. |
| 2035 | Pull out boiler front (Fig. 83A). |
| 2036 | Unscrew front truck bracket (Fig. 83B). |
| 2046 | Take out small screw in front of smokestack, then pull out boiler front. |
| 2330 | Lift out lamp bracket as shown in Fig. 83C. |
| 2343<br>2344 | Take off body by removing three screws. (See Fig. 11). |

## REPLACING HORN DRY CELLS

The remote control horns which are contained in Lionel Diesel and Electric Locomotives are powered by a flashlight dry cell which is inserted into the locomotive through an opening in its base. (See Figure 11). These cells will last a long time but eventually lose their power, even if they are not used.

These flashlight cells can be replaced by any standard size "D" cell, available in your hardware store, 5-and-10-cent store, etc. If the locomotive is stored away for a long time its a good idea to remove the cell, for it will lose its power during storage in any case.

In 2330 Locomotive the dry cell is reached by removing end truck and lifting out floor panel. The panel is held by two screws shown by arrows in Figure 83C.

## FINDING SHORT CIRCUITS

A short circuit is a direct connection between the two output terminals of the transformer or between the center rail and one of the outside rails. It causes an excessive current to be drawn from the transformer so that the transformer circuit breaker keeps on opening and closing. The short circuit may be caused by a piece of metal or wire accidentally joining the center and the outside track rails, or by broken insulation between the center rail and the metal cross-ties.